UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,211	02/06/2004	Vinod Prakash	1864.0056US1	6906

40317 7590 03/26/2009

GLOBAL IP SERVICES, PLLC
10 CRESTWOOD LANE
NASHUA, NH 03062

EXAMINER	
SAINT CYR, LEONARD	

ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
03/26/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pnama@globalipservices.com
contact@globalipservices.com
amirdha@globalipservices.com

Office Action Summary	Application No.	Applicant(s)	
	10/774,211	PRAKASH ET AL.	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2, 4 - 7, and 9 -21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,2, 4 - 7, and 9 -21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/27/08 have been fully considered but they are not persuasive.

Applicant argues that Liu et al., at least a peak value in the scale factor band remains non-zero after quantizing that scale band with the current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale band (Amendment, pages 13, and 14).

The examiner disagrees, since Liu et al., disclose that "the noise higher than the masking threshold leads to a phenomenon that the associated **band will be rounded to zero, referred to as the zero bands.** The zero bands are quite perceptually noticeable. Since the scale factor scale.sub.q is in the range of 0 - 16 and the minimum scale for these quantization bands must be zero, thus the global gain…" (paragraphs 48, and 66)

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 2, 4 – 7, and 9 - 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As per the most recent

interpretation of the Interim Guidelines regarding 35 U.S.C. 101, **claims 1, 2, 4 – 7, and 9 - 14** define non-statutory processes because they merely manipulate an abstract idea (mathematical algorithm) without a claimed limitation to produce a useful, concrete, tangible result. If the acts of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter (Benson, 409 U.S. at 71-72, 175, USPQ at 676). Furthermore, claims define nonstatutory processes if they simply manipulate abstract ideas (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759). As for guidance to areas of statutory subject matter, see 35 U.S.C. 101 Interim Guidelines (with emphasis of the Clarification of Interim Guidelines For Examination of Patent Applications for Subject Matter Eligibility); as an example, in Alappat, the claimed output smooth waveform (consisted of lighting pixels on an oscilloscope/display) is a useful, concrete, tangible, final result; in Arrhythmia, the claimed useful, concrete, tangible, final result represented the condition of a patient's heart; in State Street, the claimed useful, concrete, tangible, final result was data output that represented a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent.

Claims **1, 2, 4 – 7, and 9 – 14** reviewed in light of the specification, simply recite an abstract idea for quantizing the audio signal.

As can be seen by claims **1, 2, 4 – 7, and 9 – 14** these claims recite an abstract idea by setting forth the step of "initializing a quantization step size for each scale factor band of a current frame; determining scale factor bands for which the current

quantization step sizes for that scale factor bands is at a vanishing point," These steps are abstract in nature.

It is readily apparent that when claims **1, 2, 4 – 7, and 9 – 14** are each taken as a whole, the claims are directed to the preemption of an abstract idea, and thus are non-statutory.

Claims 1, 2, 4 – 7, and 9 – 11 are rejected under 35 USC 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps to be performed, a statutory process under 35 USC 101 must be tied to another statutory category (such as a manufacture or a machine) or transform underlying subject matter (such as an article or material) to a different state or thing. The steps in those claims can be performed manually without the use of a particular machine. Those claims could be done in a piece of paper, wherein an input signal is given, and using digital signal processing (DSP) theory to derive all the values, such as scale factor, quantization steps, number of bits, etc. as claimed by the applicant. Thus, claims **1, 2, 4 – 7, and 9 – 11** do not define a statutory process.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 4 – 7, and 9 - 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al., (US PAP 2004/0002859).

As per claim 1, Liu et al., teach a method for quantizing an audio signal, the method comprising:

initializing a quantization step size for each scale factor band of a current frame ("an iterative rate control loop adjust the …the quantization step size"; Abstract, lines 8 – 11);

determining scale factor bands for which the current quantization step sizes for that scale factor bands is at a vanishing point, wherein at least a peak value in the scale factor band remains non-zero after quantizing that scale band with the current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale band ("associated **band will be rounded to zero, referred to as the zero bands";** paragraphs 48, and 66);

comparing a number of bits consumed in coding spectral lines in each scale factor bands in the current frame at the current quantization step size to a specified bit rate ("**compares a prescribed number**"; paragraph 30, lines 14 – 19);

freezing the respective quantization step sizes for the determined scale factor bands at their vanishing point; incrementing the quantization step size of each scale factor band of the current frame that are not frozen and repeating steps of determining, freezing, comparing and incrementing, if the number of bits consumed is greater than the specified bit-rate; and exiting the quantization of the current frame when the number of bits consumed is at or below the specified bit rate ("checking if a prescribed number of bits available is enough or not for the encoded data. **If the number of bits available**

is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased"; paragraph 28, lines 2 – 6).

As per claim 2, Liu et al., further disclose grouping sets of spectral lines to form the scale factor bands in the current frame ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

assigning an initial quantization step size to each scale factor band in the current frame; and quantizing the sets of spectral lines in each scale factor band ('the quantization step size may also be adjusted"; paragraph 29, lines 9, and 10).

As per claim 3, Liu et al., further disclose that the vanishing point comprises: a quantized value of substantially close to value of `0` ("quantization bands must be zero"; paragraph 66).

As per claims 4, and 12, Liu et al., teach quantizing an audio signal comprising:

determining whether a number of bits consumed in quantizing spectral lines in scale factor bands in a current frame is at or below a user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19; paragraph 28, lines 6 – 8);

if so, freezing quantization step sizes in all the scale factor bands and exiting the quantization of the current frame ("the number of required bits for the encoding reaches the number of bits available"; paragraph 28, lines 6 – 8);

if not, incrementing quantization step size of each scale factor band by a predetermined quantization step size ("an iterative rate control loop adjust the …the quantization step size"; Abstract, lines 8 – 11);

determining scale factor bands for which the current quantization step sizes for that scale factor bands is at a vanishing point, wherein at least a peak value in the scale factor band remains non-zero after quantizing that scale band with the current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale band ("associated **band will be rounded to zero, referred to as the zero bands";** paragraphs 48, and 66); and

if not, repeating the above steps ('the quantization step size is increased … The process is repeated"; paragraph 28, lines 5 –8).

As per claims 5, and 13, Liu et al., further disclose if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point (paragraph 28, lines 5 – 8; paragraph 66);

quantizing the spectral lines of remaining scale factor bands in the current frame that are not at the vanishing point ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

determining whether a number of bits consumed in quantizing all the spectral lines of the spectral lines of the remaining scale factor bands is at or below the user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each remaining scale factor band by the predetermined quantization step size ("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining whether the quantization step sizes in one or more of the remaining scale factor bands are at the vanishing point ("quantization bands must be zero"; paragraph 66); and

if not, repeating the above steps of determining whether a number of bits, freezing, incrementing and determining whether the quantization step sizes ('the quantization step size is increased … The process is repeated"; paragraph 28, lines 5 – 8).

As per claim 6, Liu et al., further disclose if so, comparing the remaining scale factor bands with a perceptual priority chart; dropping one or more of the remaining scale factor bands as a function of the comparison ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 7, lines 9 – 11);

determining whether the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame; and if not, repeating the above steps

and dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate ("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8).

As per claim 7, Liu et al., further disclose grouping sets of spectral lines to form the scale factor bands in the current frame ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

assigning an initial quantization step size to each scale factor band in the current frame; and quantizing the sets of spectral lines in each scale factor band ('the quantization step size may also be adjusted"; paragraph 29, lines 9, and 10);

determining the number of bits consumed in each scale factor based on the quantization ("checking if a prescribed number of bits available is enough or not for the encoded data. **If the number of bits available is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased**"; paragraph 28, lines 2 – 6).

As per claim 9, Liu et al., teach a method for quantizing spectral information in an audio encoder comprising:

assigning an initial quantization step size to each scale factor band in a current frame as a function of a priority chart generated based on a perceptual model; forming a first perceptual priority chart for the assigned scale factor bands ('"adjusting the

parameters values to fit to a perceptual criterion"; paragraph 29, lines 9, and 10; paragraph 7, lines 9 – 11);

determining whether number of bits consumed in quantizing spectral lines in scale factor bands in a current frame is at or below a user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each scale factor band based on the first perceptual priority chart ("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining scale factor bands for which the current quantization step sizes for that scale factor bands is at a vanishing point, wherein at least a peak value in the scale factor band remains non-zero after quantizing that scale band with the current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale band ("associated **band will be rounded to zero, referred to as the zero bands";** paragraphs 48, and 66); and

if not, repeating the above steps ("this process is repeated"; paragraph 28, lines 5 – 8).

As per claim 10, Liu et al., further if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point ("until the number of required bits …reaches the number of bits"; paragraph 66; paragraph 28, lines 5 – 8);

forming a second perceptual priority chart by removing the one or more scale factor bands that are at the vanishing point from the first perceptual priority chart ("adjusting the parameters values to fit to a perceptual criterion implies forming a second perceptual priority chart"; paragraph 29, lines 9, and 10; paragraph 7, lines 9 – 11);

quantizing spectral lines of remaining scale factor bands that are not at the vanishing point ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

determining a number of bits consumed in the remaining scale factor bands based on the quantization; determining whether the number of bits consumed in quantizing all spectral lines of the remaining scale factor bands is at or below the user specified bit rate ("checking if a prescribed number of bits available is enough or not for the encoded data. **If the number of bits available is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased**"; paragraph 28, lines 2 – 6);

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each remaining scale factor band based on the second perceptual priority chart("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining whether all the remaining scale factor bands are at the vanishing point ("quantization bands must be zero"; paragraph 66); and

if not, repeating the above steps of determining whether the number of bits consumed, freezing the quantization step sizes, incrementing quantization step size, and determining whether all the remaining scale bands ("this process is repeated"; paragraph 28, lines 5 – 8).

As per claims 11, and 14, Liu et al., further disclose if so, comparing the remaining scale factor bands with the first perceptual priority chart; dropping one or more of the remaining scale factor bands having lower perceptual priority as a function of the comparison ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 7, lines 9 –11)

determining whether number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes of all the remaining scale factor bands and exiting the quantization of the current frame; and if not, repeating the above steps and dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate chart ("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8).

As per claims 15, 18, and 21, Liu et al., teach an audio coder comprising:

an input module partitions an audio signal into a sequence of successive frames ("bands"; paragraph 4, lines 1 – 3);

a time-to-frequency transformation module obtains the spectral lines in each frame and forms critical bands by grouping sets of neighboring spectral lines (paragraph 3, line 3); and

an encoder coupled to the time-to-frequency module, wherein the encoder further comprises:

an inner loop module determines whether a number of bits consumed in quantizing spectral lines in each scale factor band is at or below a user specified bit rate in a current frame, wherein the inner loop module freezes quantization step sizes in all the critical bands when the number of bits consumed is at or below the user specified bit rate ("the process is repeated"; paragraph 28, lines 5 – 8); and

an outer loop module increments quantization step sizes of each critical band by a predetermined quantization step size when the number of bits consumed is above the user specified bit rate, and determines whether the quantization step sizes in one or more critical bands are at the vanishing point, wherein at least a peak value in a scale factor band remains non-zero after quantizing that scale factor with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized ("a phenomenon that the associated band will be rounded to zero, referred to as the zero bands"), and wherein the outer loop module freezes the quantization step sizes of the one or more critical bands that are at the vanishing point

("two nested loop"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10; paragraph 48, last six lines).

As per claims 16, and 19, Liu et al., further disclose that the outer loop module quantizes spectral lines of remaining critical bands that are not at the vanishing point, wherein the inner loop module determines whether a number of bits consumed by the remaining critical bands is at or below the user specified bit rate, wherein the outer loop module freezes the quantization step sizes in all the remaining critical bands and exits quantization of the current frame, wherein the outer loop module increments quantization step sizes of the remaining critical bands by the predetermined quantization step size, wherein the outer loop module determines whether the remaining critical bands are at the vanishing point, and wherein the outer loop module increments quantization step sizes until the user specified bit rate is met when none of the remaining critical bands are not at the vanishing point ("a parameter adjustment is made and the quantization step size is increased"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10).

As per Claim 18, Liu et al., further discloses a bus, a processor coupled to the bus, a memory coupled to the processor (paragraph 30);

a network interface coupled to the processor and the memory; an audio coder coupled to the network interface and the processor (paragraph 13).

As per claim 17, and 20, Liu et al., further disclose that the outer loop module compares the remaining critical bands with a perceptual priority chart when all the critical bands are at the vanishing point, wherein the outer loop module drops the one or more of the critical bands having a lower perceptual quality as a function of the comparison, wherein the inner loop module determines whether number of bits consumed by the spectral lines in the remaining critical bands is at or below the user specified bit rate in the current frame, wherein the outer loop module freezes the quantization step sizes of all the remaining critical bands when the number of bits consumed by the remaining critical bands is at or below the user specified bit rate, and exits the quantization of the current frame, and wherein the outer loop module drops one or more critical bands until the user specified bit rate is met when the number of bits consumed by the remaining critical bands are above the user specified bit rate ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10; paragraph 7, lines 9 - 11).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone

number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
03/19/09

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626